

MLK029A

Product Specification

WLAN 11b/g/n WIFI+MT5931 Module

WIFI+BT(1T1R)

Version A1.0

History

Document release	Data	Modification	Initials	Approved
Version A1.0	2012/08/31	First version	Eddy	
Version A2.0	2012/12/12	First version	Eddy	
Version A3.0	2013/1/30	First version	Zhiban Qin	

1.Overview

Product Description

MLK029A is a small size and low profile of WiFi+BT combo module with LGA (Land-Grid Array) footprint, board size is 20mm*10mm with module height 2mm. It can be easily manufactured on SMT process and highly suitable for tablet PC, ultra book, mobile device and consumer product. It provides GSPI/SDIO interface for WiFi to connect with host processor and high speed UART interface for BT. It also has a PCM interface for audio data transmission with direct link to external audio codec via BT controller. The WiFi throughput can go up to 150Mbps in theory by using 1x1 802.11n b/g/n MIMO technology and Bluetooth can support BT2.1+EDR/BT3.0

MLK029A uses MT 5931&6622 IC, a highly integrated WiFi/BT single chip based on advanced COMS process. ICs almost integrates whole WiFi/BT function blocks into a chip, such as SDIO/UART,MAC,BB, AFE, RFE, PA, EEPROM and LDO/SWR, except fewer passive components remained on PCB.

1.1 WIFI features

- Operate at ISM frequency bands (2.4GHz) GSPI/SDIO for WiFi and UART for Bluetooth
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i
- Enterprise level security which can apply WPA/WPA2 certification for WiFi.
- WiFi 1 transmitter and 1 receiver allow data rates supporting up to 150 Mbps downstream and 150 Mbps upstream PHY rates
- Support sophisticated WiFi/BT coexistence mechanism to enhance collocation performance
- Support antenna diversity for WiFi and BT antenna selection
- Support Bluetooth adaptive power management mechanism
- Full-featured software utility for easy configuration and management
- RoHS compliance
- Low Halogen compliance

MT5931 provides the best and most convenient connectivity functions. MT5931 implements advanced and sophisticated radio coexistence algorithms and hardware mechanisms. The enhanced overall quality for simultaneous data, and audio/video transmission on mobile phone and Tablet PC can be achieved. The small package size with low power consumption reduces the PCB layout area.

1.2 BT feature

MT 6622 is a monolithic single chip that integrates Bluetooth V2.1+EDR/V3.0. It can be incorporated in varieties of mobile platform to provide Bluetooth connectivity. MT6622 is available in QFN40 and WLCSP package. With a very small package size and require few external BOM components, a compact footprint can be designed for today's slim mobile device.

Unparalleled performance of sensitivity and interface rejection feature, MT6622 also provides uncompromising low power performance.

It also support 10dBm transmit power with efficient power control, which provide the user with excellent link quality.

BT Radio features

- Fully compliant with Bluetooth specification V2.1+EDR/V3.0
- Integrated balun
- Supports low power scan mode support

- Fully integrated power amplifier provides 10dBm(class 1)output power
- -95dBm sensitivity with excellent interference rejection performance
- AGC dynamically adjusts receiver performance in changing environments

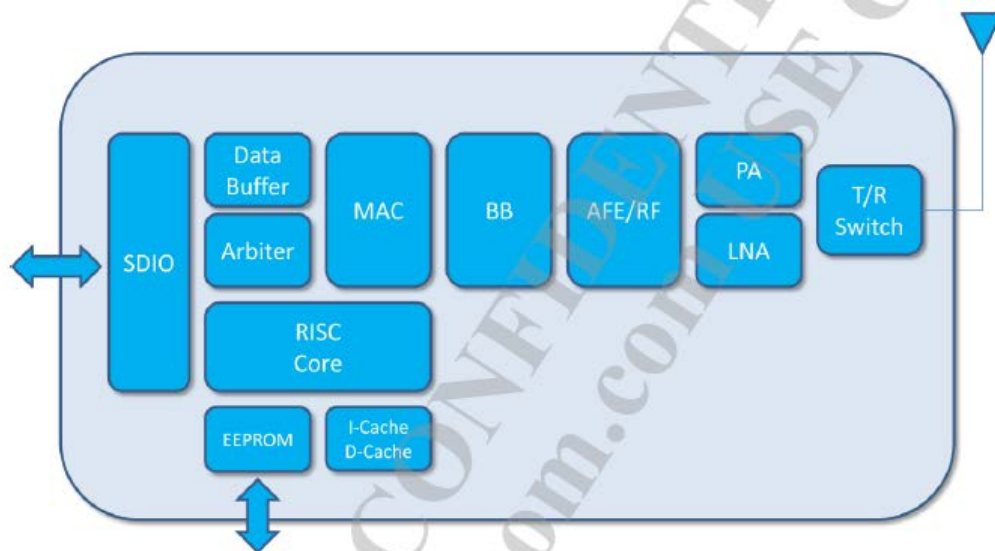
BT Baseband features

- Up to 4 simultaneous active ACL links
- Support SCO and eSCO link with re-transmission
- Scatternet support:Up to 4 piconets simultaneously with background inquiry/page scan
- Sniff mode support
- AFH and PTA collaborative support for WLAN/BT coexistence
- PCM interface and built-in transcoders for A-law, μ -law and linear voice with re-transmission support.
- Built-in hardware modem engine for access code correlation, header error correction, forward error correction, CRC, whitening, and encryption
- Channel quality driven data rate adaptation
- Channel assessment for AFH

Platform features

- 32-bit RISC microprocessor
- Integrated LDO enables direct connection to battery.
- Wide range of frequency of crystal and external reference clock support.
- High speed UART supports up to 4Mbps baud rate
- Built-in RAM and ROM with patch system
- External LPQ clock support for sleep mode
- Supports standard HCI interface.
- Idle mode and sleep mode design enables ultra low power performance

2.Block Diagram



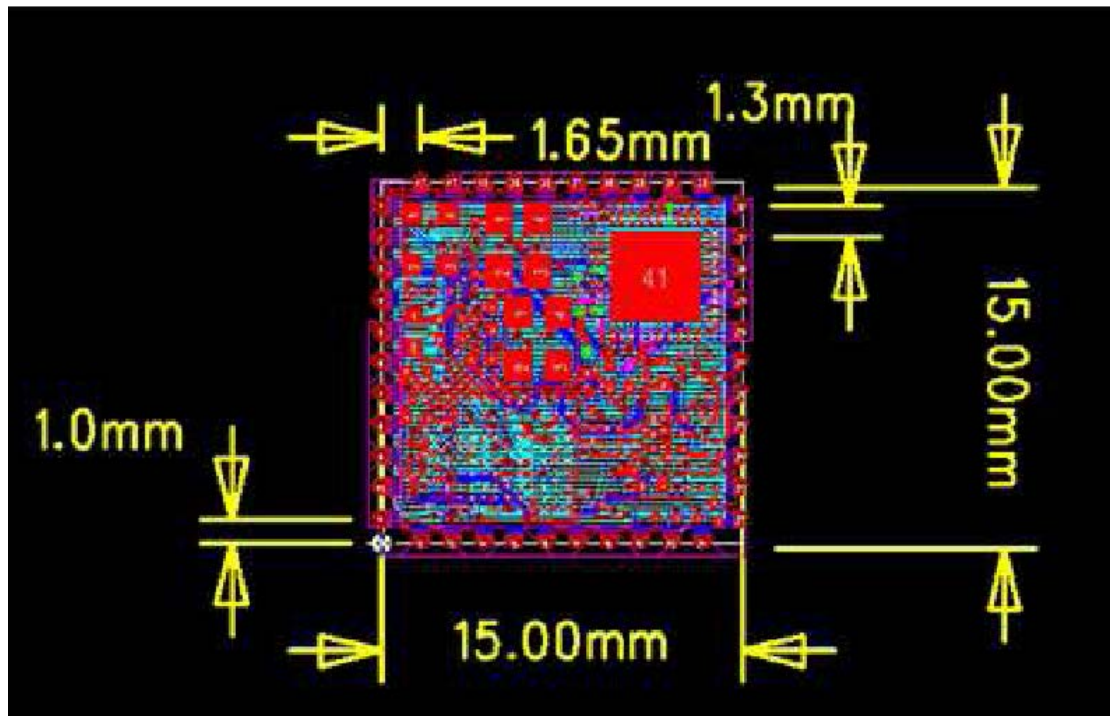
3.General Specifications

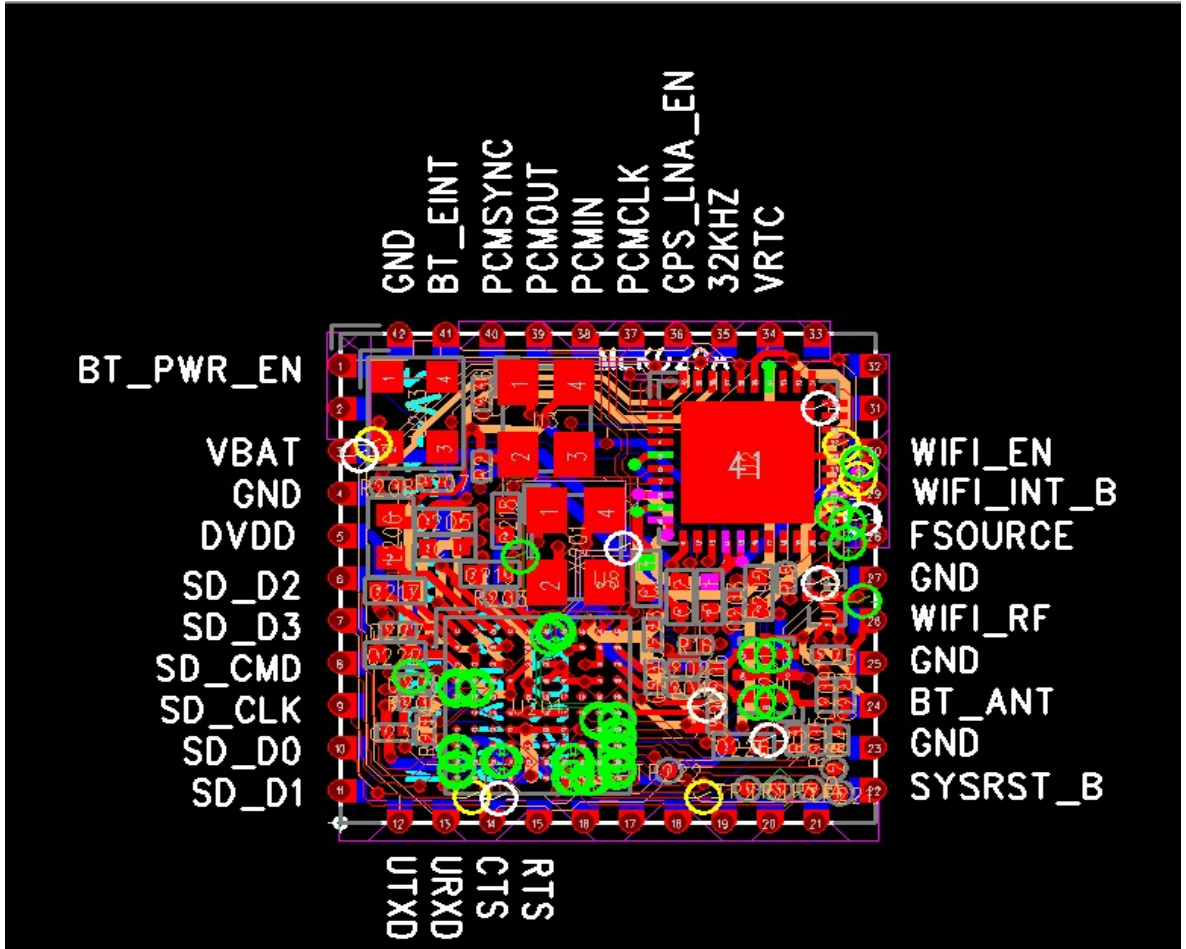
Model Name	MLK029A
Product Description	SDIO WIFI +BT
WLAN Standard	IEEE 802.11 b/g/n, Wi-Fi Compliant
Host Interface	SDIO
Major Chipset	MT5931 MT6622
PCB Dimension	15mm X 15mm
PCBA Weight	About 5g
Operating Conditions	
Voltage	3.3V
Operating Temperature	0~70°
Humidity Non-Operating	90% RH non-condensing (12 months among 0~40°C)
Electrical Specification	
Frequency Range	2.4~2.4835GHZ
Spread Spectrum	DSSS
Transmission Distance	300m(The transmission speed may vary according to the environment)
Data Rate	11n: 150/135/120/90/60//54/45/30/15Mbps 72/65/57.8/43.3/28.9/21.7/14.4/7.2Mbps
	11b: 1/2/5.5/11Mbps
	11g: 6/9/12/24/36/48/54Mbps
Transmit power	15dbm
Receiver Sensitivity	150M:-71dbm@10%PER
	135M: -71dbm@10%PER
	54M:-71dbm@10%PER
	11M:-84dbm@10%PER
	6M:-89dbm@10%PER
	1M:-93dbm@10%PER
Data Security	64/128/152bitWEP,WPA/WPA2,WPA-PSK/WPA2-PSK(TKIP/AES)
Environment	Storage Temperature: -40~70°C(-40 °F ~158 °F)
	Relative humidity:10%-90%
	Non-condensing
	Storage Humidity:5%~95%
	Non-condensing
Modulation Type	OFDM/CCK/16-QAM/64-QAM
Operating System	Window98,ME,SE,XP,XP-64 Windows7, 32/64, 2000,Vista,linux,mac

4.Power Consumption

Parameters	Sym	Condition	Min	Typ	Max	Unit
3.3V Supply Voltage	Vcc33		3.2	3.3	3.4	V

5.Mechanical Information





6.Pin Description

1	BT_PWR_EN	22	SYSRST_B
2		23	GND
3	VBAT	24	BT-ANT
4	GND	25	GND
5	DVDD	26	WIFI_RF
6	SD_D2	27	GND
7	SD_D3	28	FSOURCE
8	SD_CMD	29	EXT_INT_B
9	SD_CLK	30	WIFI_EN
10	SD_D0	31	
11	SD_D1	32	
12	UTXD	33	
13	URXD	34	VRTC
14	CTS	35	32KHZ
15	RTS	36	GND
16		37	PCMCLK
17		38	PCMIN
18		39	PCMOUT
19		40	PCMSYNC
20		41	BT-EINT
21		42	GND

7. Patch installed before Precautions

- 1)When customers in SMT, make sure the WIFI module to open a large hole in the pad, press 1 to 1 ratio in order to expand outward 0.7mm open,keep the thickness at 0.12Mm.
- 2)when the WIFI module patching on the line, it is suggested bake for 12 hours or more, the temperature at $120 \pm 5^\circ$.
- 3)After the baking finished, it is recommended to put it on the line immediately, do not put out the WIFI module out of the ovens before the baking is done. It is recommended to stick as the number it can be taken out. .
- 4)When taking the WIFI module, do not process it with your naked hands, be sure to wear gloves and wrist strap.
- 5)The furnace temperature is depended on the size of the motherboard, usually attached to the Tablet PC as the temperature at $250 \pm 5^\circ$

8. Product ordering information

MLK029A support 802.11b/g/n, 3.3Voltage. And please mark clearly your need about Antenna Interface and voltage information.

9. FCC Statement

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

This radio module must not be installed to co-locate and operate simultaneously with other radios in host system; additional testing and equipment authorization may be required to operating simultaneously with other radios.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

USERS MANUAL OF THE END PRODUCT:

The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module. Appropriate measurements (e.g. 15 B compliance) and if applicable additional equipment authorizations (e.g. Verification , Doc) of the host device to be addressed by the integrator/manufacturer.

Attention:

This RF Module does not have an own shielding, so that a Limited Modular Approval (LMA) was granted: This RF module is strictly limited to the integration by the Grantee himself or the dedicated OEM integrators under the control of the Grantee. Proper measurements of the host device including this RF module (radiated spurious emissions and bandedge) are required to assure compliance with the FCC regulations.

Any other integrator must contact the Grantee to determine necessary compliance measurements and/or additional equipment authorizations (e.g. Class II Permissive Change or New Equipment Authorization) for his configuration.

This RF Module must not be sold to the general public.

IMPORTANT NOTE: In the event that these conditions cannot be met (for example: certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Label Instructions

The final end product must be labeled in a visible area with the following " contains TX FCC ID: GCOMLK002A ". If the size of the end product is larger than 8x10 cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undedired operation.